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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/922,723 | 08/07/2001 | Toshiyuki Ogata | Q65755 | 1261 |

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
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EXAMINER

LEE, SIN J

ART UNIT PAPER NUMBER

1752

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/922,723

Applicant(s)

OGATA ET AL

Examiner

Sin J. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8 and 9 is/are rejected.
- 7) ☒ Claim(s) 7 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

1. Applicants canceled claim 2.
2. In view of the amendment dated October 2, 2003, previous 102(b) rejections made on claims 1 and 8-10 over Tsuchiya et al'844 and previous 102(b) rejections made on claims 1, 8, and 9 over Takemura et al'396 are hereby withdrawn. Neither of those references teaches or suggests the present alkali-soluble polysiloxane resin, which comprises (a1) a siloxane unit containing an alkali-soluble group, and (a2) a siloxane unit containing an alkali-insoluble group, the alkali-insoluble group having no acid-decomposable group.
3. In view of the certified English translation of the priority document, Japanese application No. 2000-240871 *filed August 9, 2000*, previous 103(a) rejections made on claims 1-10 over Ogata et al (JP 2001-51422), which *publication date is February 23, 2001*, in view of Honda are hereby withdrawn.
4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Claims 1, 3-6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokutake et al (JP 04-130324 and its English translation) in view of Honda (5,565,304).

Tokutake teaches (see claims 1 and 2 of English translation) a positive type resist composition containing an alkaline-soluble ladder type silicon polymer which has repeating units of $(\text{HO}-\text{C}_6\text{H}_4-\text{CH}_2-\text{SiO}_{3/2})$ and repeating units of $(\text{C}_6\text{H}_4-\text{CH}_2-\text{SiO}_{3/2})$, and 1,2-naphthoquinone diazide group-containing compound (*a photoacid generating compound*). The repeating unit of $(\text{HO}-\text{C}_6\text{H}_4-\text{CH}_2-\text{SiO}_{3/2})$, which is *hydroxybenzylsilsesquioxane unit*, is presently claimed siloxane unit containing an alkali-soluble group (hydroxyl group), and as shown in the formula, the hydroxyl group is bonded to the silicon atom of the siloxane group through a benzyl group (an aralkylene group). The repeating unit of $(\text{C}_6\text{H}_4-\text{CH}_2-\text{SiO}_{3/2})$, which is *benzylsilsesquioxane unit*, is presently claimed siloxane unit containing an alkali-insoluble group (an aralkyl group) having no acid-decomposable group.

Therefore, Tokutake teaches present inventions of claims 1-6 except for the present component (C) which is a compound in which at least one hydrogen atoms of the phenolic hydroxyl group or carboxyl group of the compound is substituted with an acid-decomposable group. Honda teaches (col.2, lines 63-67, col.3, lines 1-42, col.6, lines 27-48) adding dissolution inhibitors to a photoresist composition containing an alkali-soluble resin and a photoacid generating compound in order to control the

dissolution rate of the photoresist composition films, particularly to inhibit the dissolution of the resist films in unexposed areas, while they can be deprotected by acid moieties generated from a photoacid generator under irradiation to enhance the dissolution rate of the resist films in exposed areas. Honda teaches that preferably those inhibitors are selected from a family of oligomeric *phenolic compounds, the hydroxyl groups of which are protected with substituents (such as tert-butoxycarbonyl, tert-butyl, or tetrahydropyranyl group) which can be deprotected in the presence of acidic compounds*. In particular, Honda teaches 1-[1'-methyl-1'-(4'-hydroxyphenyl)ethyl]-4-[1',1'-bis(4-hydroxyphenyl)-ethyl]-phenol (also known as TRISP PA) as a good candidate of the backbones of the dissolution inhibitor added for the purpose of enhancing the contrast between the unexposed and exposed areas. Since Tokutake also teaches a photoresist composition containing an alkaline soluble resin and a photoacid generating compound, it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to add a dissolution inhibitor such as TRISP PA to Tokutake's positive photoresist composition in order to enhance the contrast between the unexposed areas and exposed areas as taught by Honda. The chemical structure for TRISP PA teaches present formula (I) of claim 8. In the present formula, Z's would be hydroxyl groups, R¹-R³ would all be hydrogen atoms, and A would be -C[Me][C₆H₄-C(Me)(Me)-C₆H₄-OH]- which meets the present second chemical formula represented for A (In the present formula, R⁴ would be a methyl group, R⁷ and R⁸ would be methyl groups, R⁵ and R⁶ would be hydrogen atoms, and Z would be a hydroxyl group).

Therefore, Tokutake in view of Honda would render obvious present inventions of claims 1, 3-6, 8, and 9.

Allowable Subject Matter

6. Claims 7 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Tokutake does not teach or suggest present phenylsilsesquioxane unit of claim 7. In the Implementation example 1 (see English translation), Tokutake applies his resist composition solution in uniform thickness of 1.3 micrometer (which converts to 1300 nm) onto a silicon wafer, and the reference does not teach or suggest the presently claimed thickness range (50 to 200 nm) for the resist layer.

Response to Arguments

7. Applicants argue that 1,2-naphthoquinone diazide group-containing compound as taught by Tokutake is not an acid generator as claimed in the present invention, and thus it cannot teach a composition having an alkali-soluble resin and a photoacid generating compound, to which a dissolution inhibitor of Honda may be added as stated by the Examiner.

In response, the Examiner is enclosing a reference, Itatani et al (6,630,064 B1), in order to support the Examiner's assertion that Tokutake's 1,2-naphthoquinone diazide group-containing compound is a photoacid generator. See claim 4 of Itatani, which proves that esters of naphthoquinone diazide sulfonic acid with

trihydroxybenzophenone is a photoacid generator. See also, Tokutake's Implementation Example 1 where he uses the ester of naphthoquinone diazide sulfonic acid with trihydroxybenzophenone as the 1,2-naphthoquinone diazide group-containing compound. Therefore, Tokutake's 1,2-naphthoquinone diazide group-containing compound is a photoacid-generating compound.

Applicants also argue that Tokutake does not disclose present component (C), and Honda does not disclose present component (A). Therefore, applicants argue that there is no motivation to combine both references. However, as already explained above, Honda teaches adding dissolution inhibitors to a photoresist composition containing an alkali-soluble resin and a photoacid generating compound in order to control the dissolution rate of the photoresist composition films, particularly to inhibit the dissolution of the resist films in unexposed areas, while they can be deprotected by acid moieties generated from a photoacid generator under irradiation *to enhance the dissolution rate of the resist films in exposed areas*. Since Tokutake also teaches a photoresist composition containing an alkaline soluble resin and a photoacid generating compound, it is the Examiner's position that there is enough motivation (i.e., to enhance the contrast between the unexposed areas and exposed areas as taught by Honda) for one of ordinary skill in the art to add Honda's dissolution inhibitor such as TRISP PA to Tokutake's positive photoresist composition.

For the reasons stated above, present rejections of claims 1, 3-6, 8, and 9 over Tokutake et al in view of Honda still stand.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (571)272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff, can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

S. J. Lee

S. Lee
December 26, 2003

Sin J. Lee

Patent Examiner
Technology Center 1700

Mark F. Huff

Mark F. Huff